



MOS 2.0

Modeling the Next Revolutionary Mission Operations System

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Overview

- Definition & Scope
- Future (“To-Be”) System
- Early Results
- Next Steps



Definitions & Scope

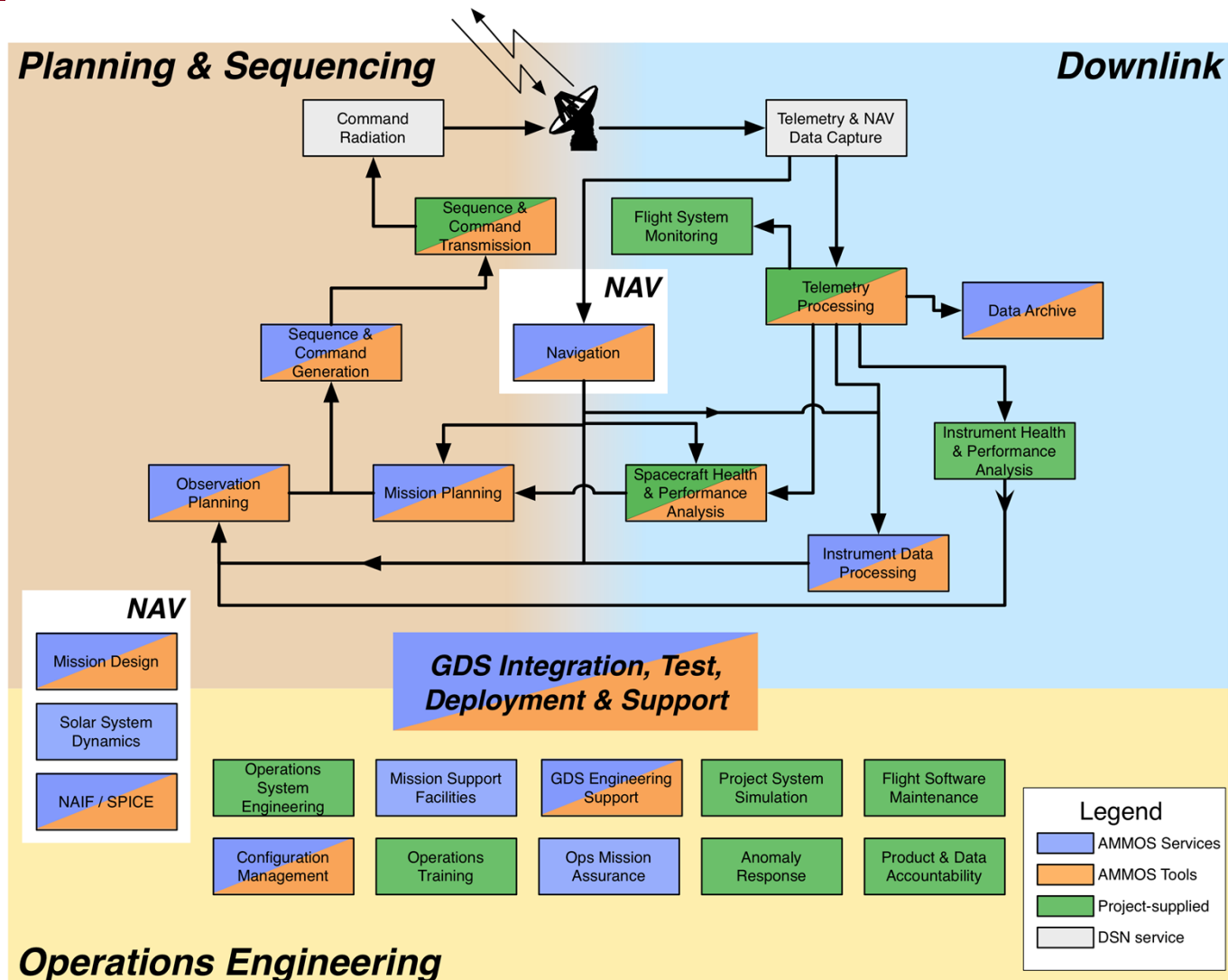


Definitions

- Operations Revitalization Initiative
 - This project
- AMMOS
 - Multimission tools and services, current Ops system
- MOS 2.0
 - Vision and direction for next-generation MOS
 - Ops Revitalization products:
 - New “Operations Layer” for AMMOS



Current System





Future System

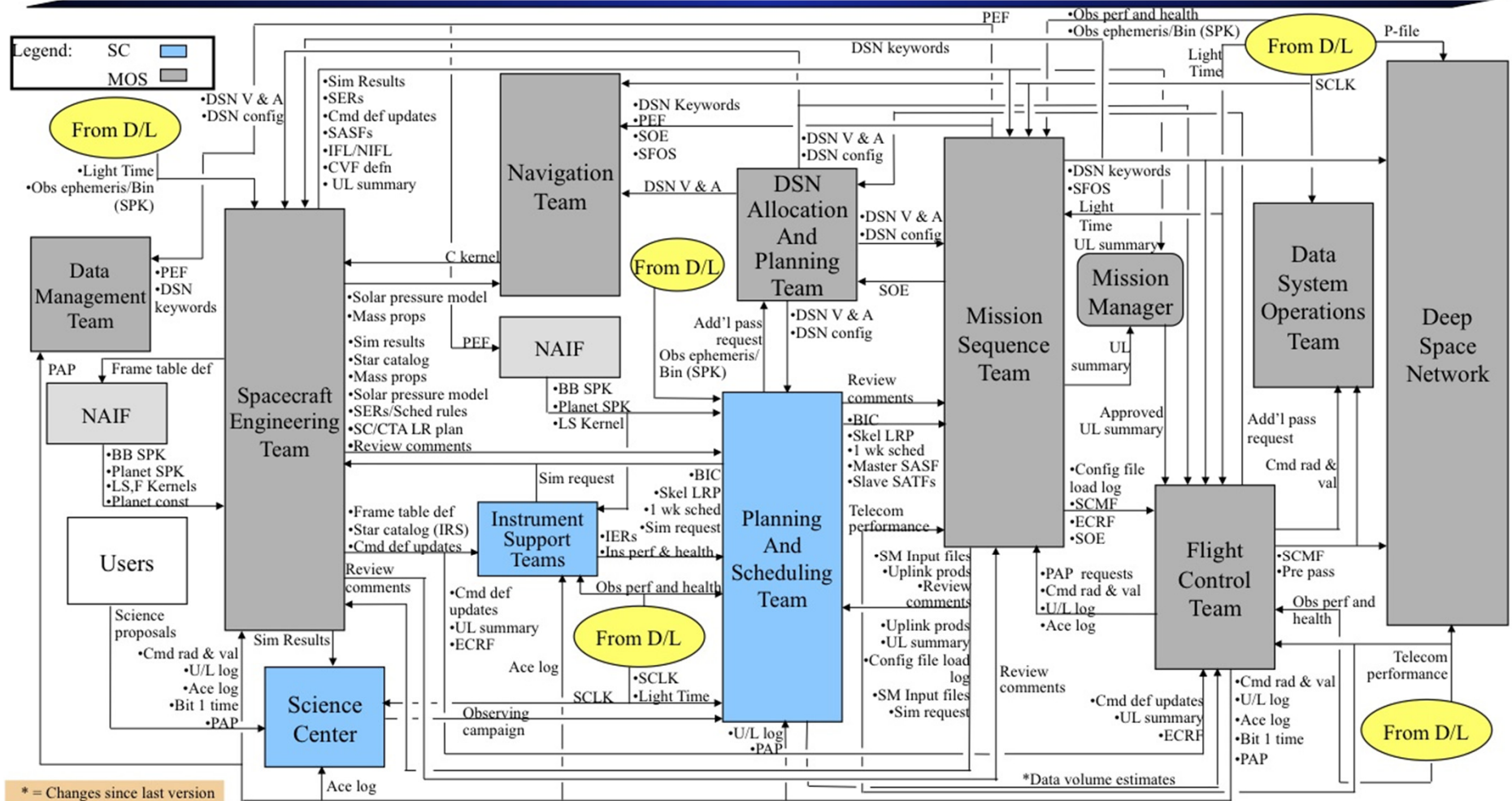


Principles

- MOS as a closed-loop control system
 - Enabled by supporting information model
 - Forces us to think “outside our stovepipes”
- “Develop with what you fly with”
 - “Rapid prototyping” approach to design and implementation of MOS capabilities
 - Exercise system-level functionality early on
- Service orientation
 - Provide multimission capabilities to missions via services
 - Provide multi-mission value to MOS at each Phase in lifecycle

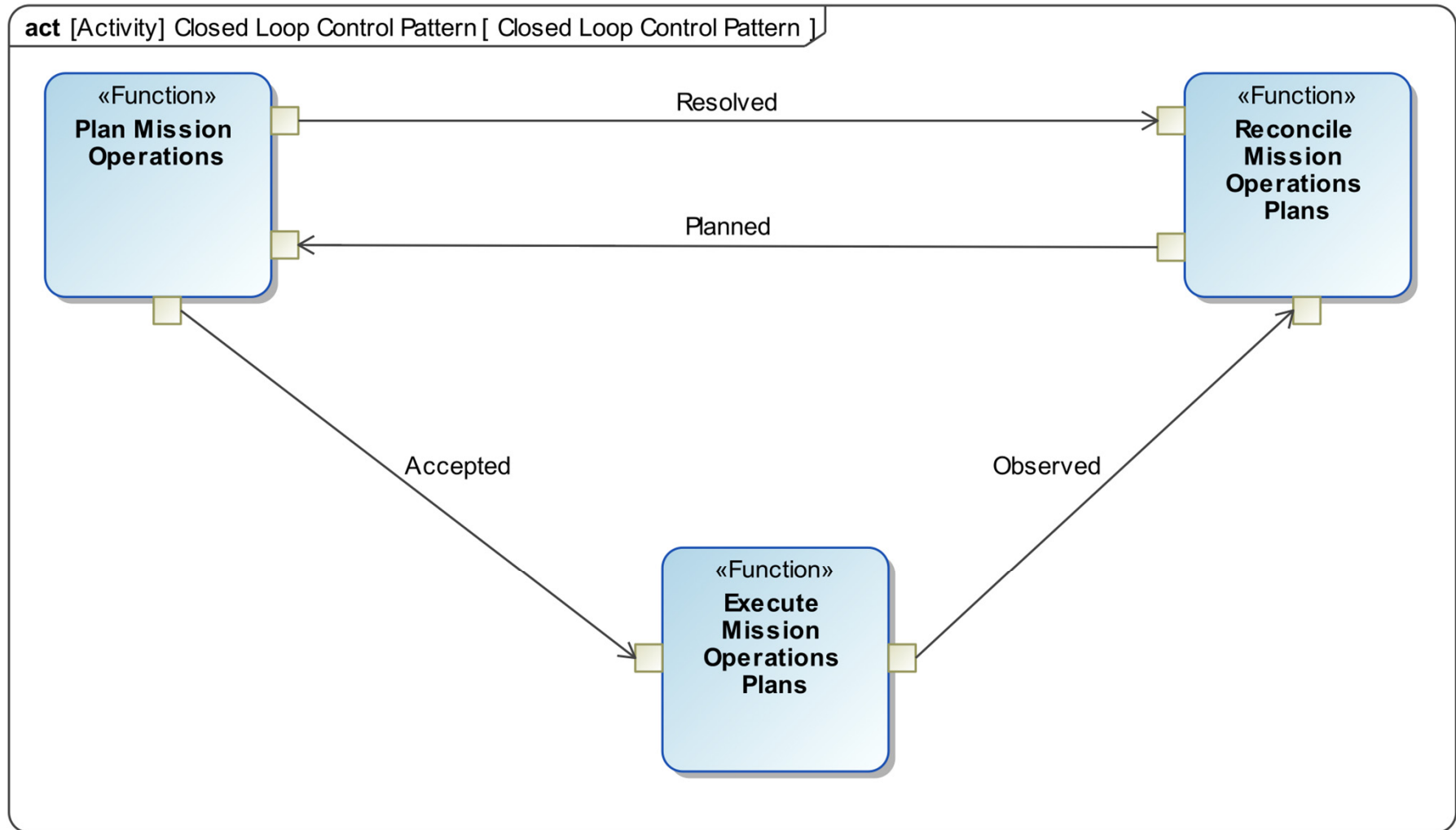


MOS View “As-Is”





Control System View – “To-Be”





MOS 2.0 Services

bdd [Package] MOS 2.0 Services [MOS 2.0 Services View Duane]

EXTERNAL MOS2MOS SERVICES

«Service»
«system»
**Deep Space Telecommunications Resource
Coordination & Scheduling**

Mission Operations System

«Mission Operations System (MOS)»
«Service»
MOS 2.0

PRINCIPAL MOS MISSION SERVICES

«Service»
Mission Planning Service (MPS)
...

«Service»
Mission Execution Service (MES)

«Service»
Mission Analysis Service (MAS)

DISCIPLINE MOS SERVICES

«Service»
**Mission Engineering
Service**

«Service»
**Flight - Ground
Communications
Engineering Service**

«Service»
**Flight System
Engineering Service**

«Service»
**Science and Instruments
Engineering Service**

«Service»
**Navigation Engineering
Service**

INFRASTRUCTURE SERVICES (INCOMPLETE)

«Service»
**Configuration
Managment Service**

«Service»
**Data Managment
Service**

«Service»
Visualization Service

«Service»
**Operations Access &
Security Service**

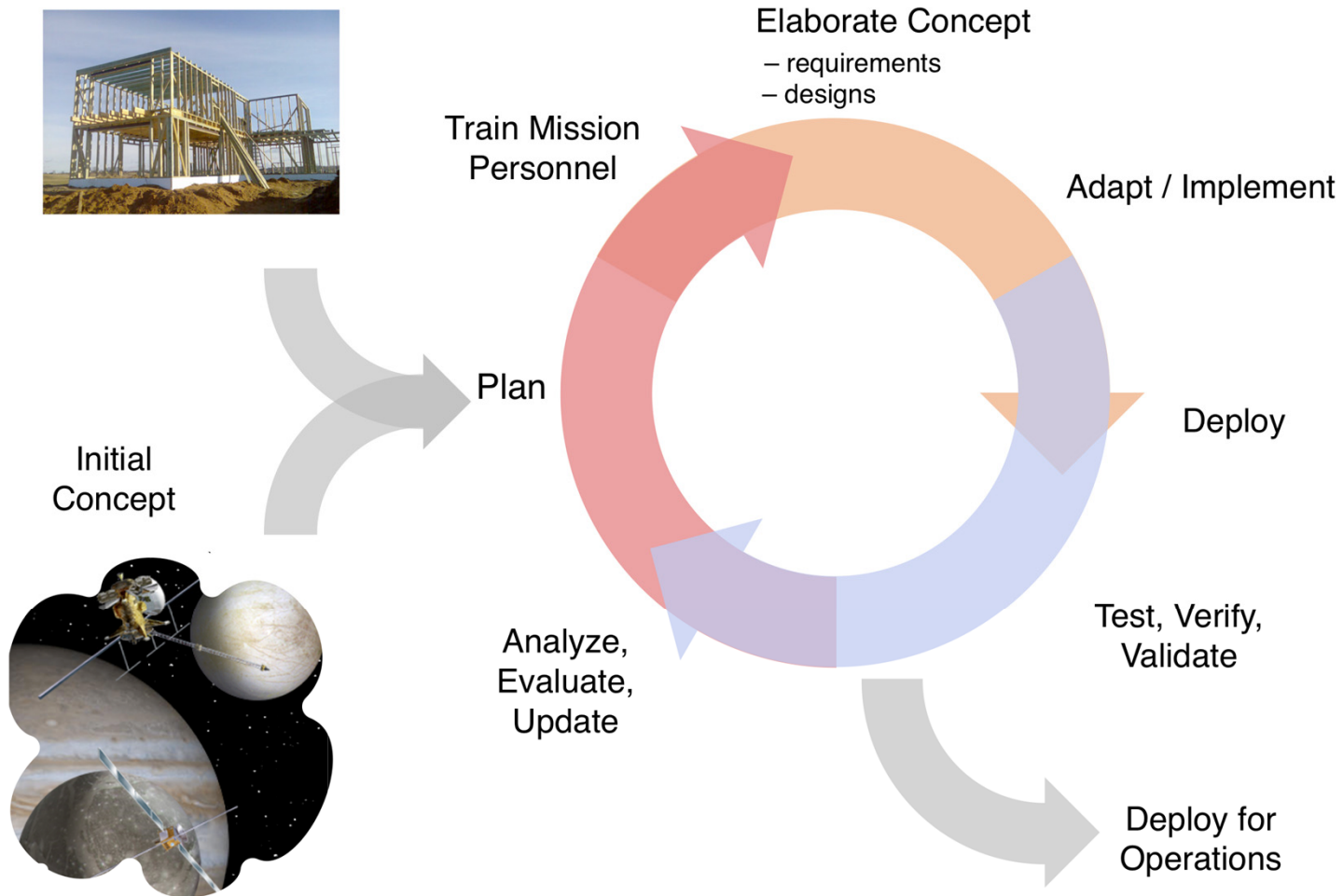
«Service»
Simulation Service

«Service»
**Process
Orchestration Service**

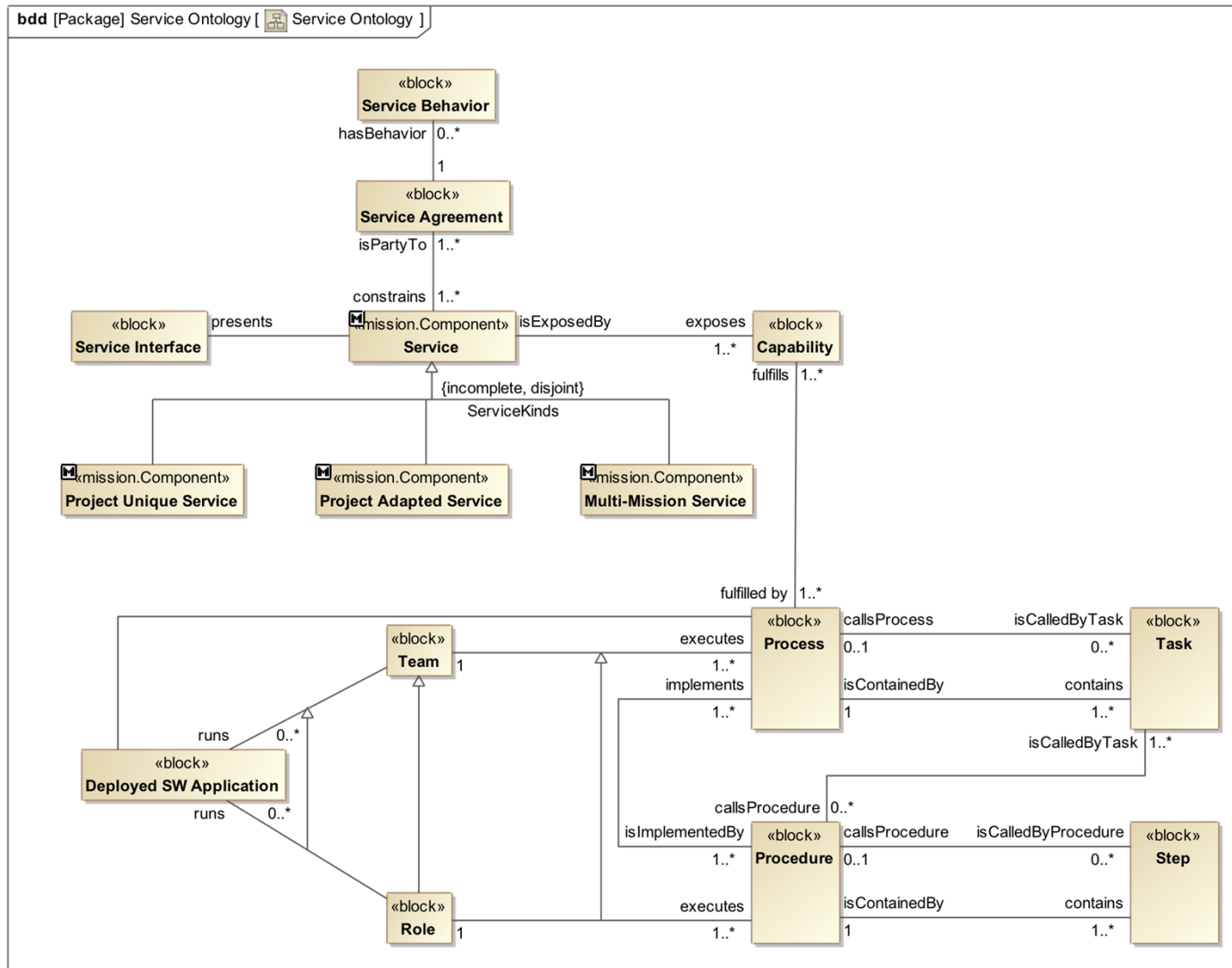


To-Be: “Develop with what you fly with”

MOS 2.0 Framework



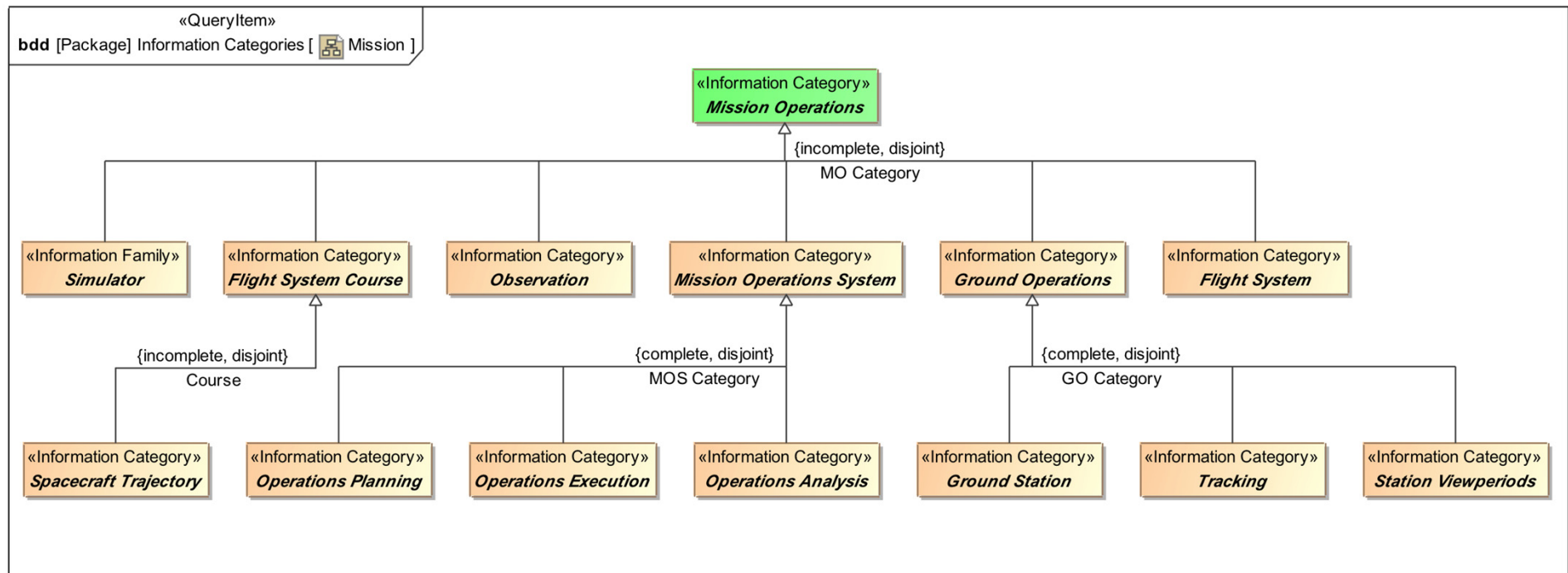
Fundamentals of MOS





Information Architecture

- Re-assert information content over format
- Adopt common, standards-based formats to facilitate interchange





Approach



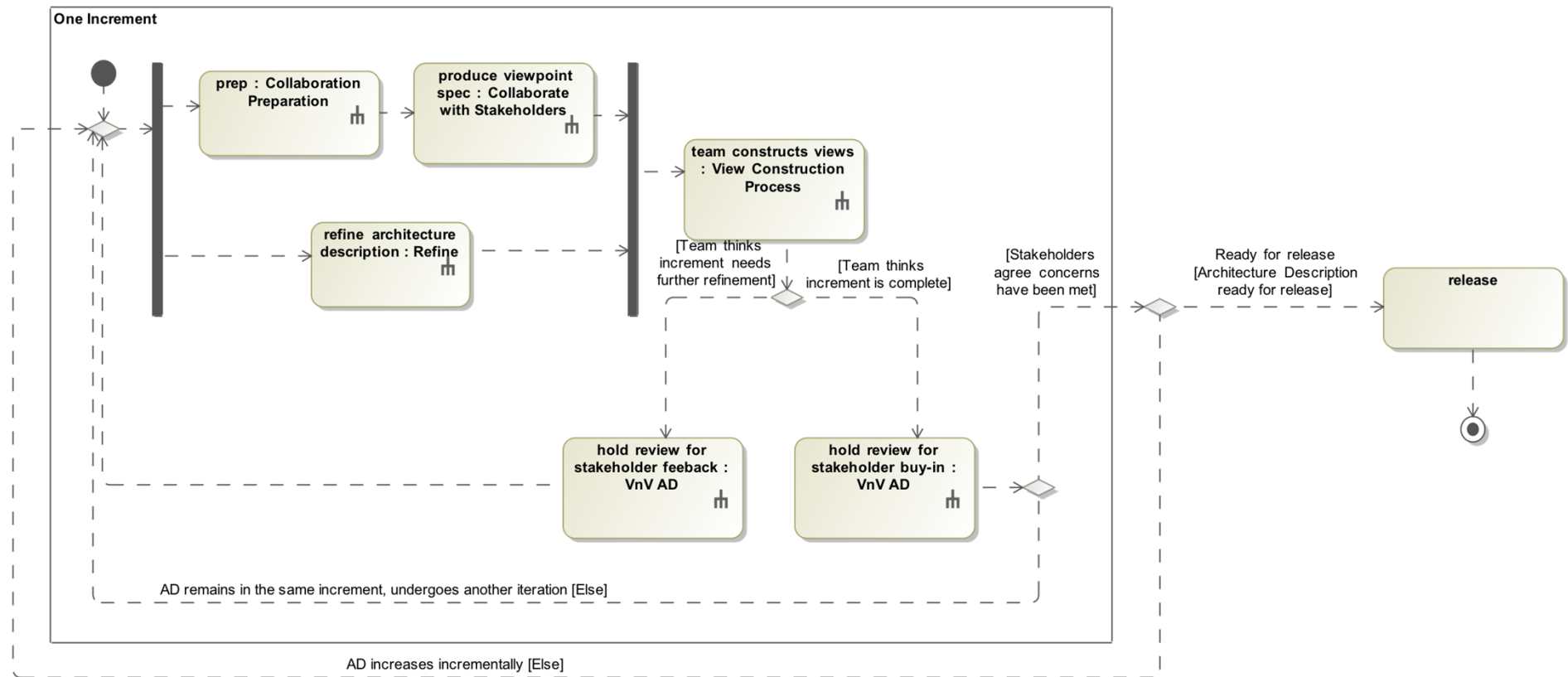
Stakeholders

- Addressing stakeholder concerns is central to Ops Revitalization
 - Called for by architecture standard
 - ISO 42010 / IEEE-1471
 - *“People support what they help create. People affected by a change must be allowed active participation and a sense of ownership in the planning and conduct of the change”*
 - Richard Beckhard (1969). *Organization development: strategies and models*



Stakeholder Collaboration

act [Activity] Collaboration Process [Collaboration Process]





Some Early Results



Early Benefits

- Automated Document generation
 - MBSE methods don't yet replace docs
 - Still needed for review, communication
 - Simple, adaptable scripting capability
 - Builds document into models
 - “Pushbutton” updates to documents
 - Engineers spend less time in Word, Visio, Excel, Powerpoint...
 - Lower cost for review products at Project KDPs



New Capabilities

- MOS Metamodel
 - Fundamental basis for modeling MOS
 - Ontology (“Language”) for rigorous description of key MOS concepts
 - Capability, Service, Process, Procedure...
 - Timeline (for describing most MOS information)
 - Enables MSL to model Tactical Uplink and to establish clear relationships between functional process and software needs



New Capabilities

- Scenario Catalog / Process Dashboard
 - Central repository for adaptable mission scenarios & processes
 - User-friendly, non-expert authoring tool for
 - Developing Ops Concepts & scenarios
 - Developing rigorous Ops processes
 - Deploying process to Ops & enabling situational awareness & collection of metrics
 - Transfer to/from expert tools as needed
 - Facilitates adoption, enables reuse, enhances quality



Future

MOS 2.0 Products	Description	Planned Completion
System Architecture	Views, Documentation, and Model of MOS 2.0	FY 2012
Information Architecture	Views, Documentation, and Model of Information Products used in MOS 2.0	FY 2012
Planning, Execution, Analysis Service	Views, Documents, Models of the Principal Services	FY 2011
Discipline Services	Services Available to Missions for Phases A-E	FY 2011-14